Update

Ministry

Environment and Protected Areas

Describe: Basic Job Details

Position

Position ID

Position Name

OSM Watershed Scientist

Current Class

Scientific 3

Job Focus

Operations/Program

Supervisory Level

00 - No Supervision

Agency (ministry) code

Cost Centre

Program Code: (enter if required)

Employee

Employee Name (or Vacant)

Vacant

Organizational Structure

Division, Branch/Unit

Resource Stewardship/ Oil Sands Monitoring Branch

Supervisor's Position ID

Supervisor's Position Name

Dir,Environ Science&FieldOpe

Supervisor's Current Class

Senior Manager (Zone 2)

Design: Identify Job Duties and Value

Changes Since Last Reviewed

Date yyyy-mm-dd

2024-10-21

Responsibilities Added:

None - responsibilities better clarified

Responsibilities Removed:

None

Job Purpose and Organizational Context

Why the job exists:

The OSM Watershed Scientist (Scientific 3) position is accountable for safe and effective delivery of monitoring, evaluation, and reporting, with a specialization in lotic systems under the Oil Sands Monitoring (OSM) Program delivered by the Oil Sands Monitoring Branch. This position is responsible for providing scientific expertise and leadership to support the legislated science mandate, “to develop and implement an environmental science program to monitor, evaluate, and report on the condition of Alberta's ambient environment” (Section. 15.1(1) Environmental

Protection and Enhancement Act, 2016). A key aspect of this role is to function as part of a small team of Watershed Scientists to achieve the strategic goals of the OSM Program and Branch direction. Further, the position is responsible for leading and guiding the development, modernization, and long-term monitoring programs, as well as implementation of research studies in lotic systems and watershed sciences. This role ensures that the Oil Sands Monitoring Program and its partners and stakeholders, including the Government of Alberta, receive scientifically credible and relevant information needed to responsibly manage Alberta's watersheds and specifically lotic systems, in the face of increasing pressure from industrial development, a growing population, climate change, and other pressures. This position may also contribute to lotic programs under the Ministry of Environment and Protected Areas.

Key outcomes of this Scientific 3 position are: generating and/or contributing to novel scientific ideas and approaches to be pursued by the watershed scientists within OSM, the Government of Alberta, and nationally; providing expert advice on scientific program and project design; leading large-scale, multi-year scientific programs that bridge scientific disciplines; and publishing scientific findings on the condition of the environment across media. The OSM Watershed Scientist (Scientific 3) will be regularly invited to present at scientific meetings and conferences, publish peer-reviewed papers, and provide expert advice to OSM leadership on the cumulative impacts of human activity on water quality. The position is for a scientist with expertise in surface water quality.

Responsibilities

The OSM Watershed Scientist (Scientific 3) is responsible for four (4) core results related to lotic quality, and biologically focused environmental monitoring, evaluation and reporting delivered by the Oil Sands Monitoring (OSM) Branch: **Design**, **Planning**, **Delivery**, **Evaluation and Reporting**. These responsibilities include:

1. Design (10%): lead the review, development and continuous improvement of long-term lotic water quality monitoring programs as well as lotic research that address major issues of concern to the OSM Program and the Government of Alberta. The end result is an internationally recognized lotic science and monitoring program that supports the government's business mandate, including:

- Working with OSM leadership, scientists and the larger scientific community to prioritize lotic program design, monitoring and research program that is aligned with OSM needs, and emerging lotic focussed resource priorities identified by the international scientific community.
- Ensuring integration between lotic monitoring and research programs and other environmental monitoring under the OSM Program and Environment and Protected Areas at large;
- Addressing recommendations of the OSM Technical Advisory Committee (TAC), the Science and Indigenous Knowledge Integration Committee (SIKIC) and the Oversight Committee (OC). The position may be required to present scientific plans and findings to diverse audiences;
- Working with leadership, scientists and staff in other EPA Branches to ensure innovative, scientifically credible research and monitoring protocols are conceived and deployed in OSM lotic monitoring and science programs.
- Working with OSM Branch staff to support braiding between western science and indigenous wisdom in the design and implementation of lotic research and monitoring programs;
- Developing and publishing conceptual models based on the latest science that summarize the known and hypothesized responses of lotic systems to environmental variation and anthropogenic stressors including climate change, land use, contaminants, and human use.

2. Planning (15%): contributes to developing multi-year research and monitoring plans that are driven by scientific questions to assess the condition of Alberta's lotic systems. Plans also include scientific evaluations of the impacts of human activities and ecological drivers such as climate change. Activities include:

- Completing annual project plans and budgets for OSM lotic monitoring and research projects, that articulate outcomes, activities, schedules and resource requirements;
- Ensuring short-term focused studies and research projects contribute to large-scale understanding of lotic quality, and resources within Alberta;
- Identifying innovative methods to observe and measure lotic conditions by staying up to date with the latest science and frequent interaction with international scientists;

- Leveraging OSM budgets for lotic system monitoring and research by reviewing as well as preparing and submitting research grant applications.

3. Delivering (10%): ensures long-term lotic monitoring and research programs are delivered in a safe and effective manner. The end result is safe and timely completion of deliverables within the available budget. Activities include:

- Collaborating with scientific and technical staff in the OSM Branch by visiting field sites and analytical labs, and meeting with staff to anticipate and troubleshoot scientific and technical challenges encountered during program delivery, including providing ongoing data validation of lotic quality;
- Coordinating the involvement of indigenous community members and volunteers;
- Developing and managing grants and contracts with delivery partners and vendors;
- Considering and incorporating Occupational Health and Safety in all aspects of program delivery.

4. Evaluation and Reporting (65%) - Develops, leads and actively participates in the analyses and completion of scientifically credible environmental data evaluation and reporting that meet project plan commitments and legislated reporting requirements. The end results are OSM technical reports, synthesis reports, contributions to the State of the Environment reports and peer-reviewed papers in international journals. Activities include:

- Developing the conceptual design, analytical approaches and implementation of robust analyses of lotic quality data to support standard and non-standard reporting products, including integration with other disciplines including, not limited to groundwater, wetlands and surface water.
- Leading and/or participating in the communication of major observations and conclusions of long-term monitoring and focused research activities on the condition, status and trends of Alberta's lotic quality including but not limited to primary and collaboratively authored peer-reviewed scientific papers, technical and state of the environment reports, major scientific synthesis reports, and plain-language summary documents;
- Collaborating with internal and external scientific experts on additional evaluation of, and reporting on, lotic quality data sets to ensure scientific linkages with programs and interpretations employed elsewhere in Canada, and internationally;
- Preparing and providing credible and defensible scientific content for meetings, workshops, conferences, web pages, and briefing packages;
- Chairing scientific boards, panels and committees at the regional level;
- Participating at the provincial and national level in scientific committees and task forces requiring Alberta lotic quality expertise;
- Effectively communicating complex scientific issues/results to a wide range of expert and non-expert audiences, thereby ensuring government, industry, and public stakeholders can best employ or apply the information resulting from the OSM Program's lotic quality monitoring, evaluation and reporting programs.

Problem Solving

Typical problems solved:

- Develop research initiatives, new methods/techniques, and research proposals requiring analytical and/or interpretative thinking, creative thinking, and problem solving skills.
- Position can determine how research projects are done independently once the priorities and needs are determined and approved by the OSM Program's Oversight Committee;
- Apply scientific expertise, knowledge and understanding to interpret and provide advice on monitoring results to various internal and external stakeholders;
- Address challenging problems related to the health of lotic systems and resources in the OSR, resulting from scientific uncertainty over the environmental mechanisms by which anthropogenic activities and natural drivers such as climate, affect lotic systems;
- Participate in and lead a diverse lotic based science program generating new knowledge that enables creative solutions to current and anticipated lotic problems including contamination, contaminant transport and dispersal, fluid-sediment interactions, changing lotic-groundwater-surface water interaction, impacts of industrial, agricultural, and other activities, climate change, etc.
- Lead programs that incorporate multiple disciplines including: groundwater quantity, aquatic chemistry, hydrology,

aquatic ecology, statistics, sediment transport and fate, (bio) geochemistry, wetland science, geospatial science, modelling and limnology;

- Identify and design research programs delivered by teams involving academia, industry, indigenous community members, and government. The position collaborates with monitoring staff and scientific collaborators in all phases of monitoring and research programs, from conception to delivery and reporting;
- Address issues in one or more specialized areas of lotic science, using cutting edge approaches with potential for the findings to set precedents for wide scale (local, regional, national, global) use;
- Collaborate on research in an environment where guidelines or scientific standards are inadequate and significant scientific or technological innovations are required;
- Communicate scientific findings and their implications with various stakeholders including media from provincial and national news organizations;
- Collaborate with academic and other scientists to accelerate the creation of new lotic knowledge and solutions thereby extending the reach of the Alberta's scientific programs;
- Develops and conducts lotic quality research which could have considerable influence on scientific knowledge and management of Alberta's water resources.

Types of guidance available for problem solving:

Guidance for solving lotic quality and related science problems is provided by multiple complex standard operating procedures, advice from colleagues including other technologists, scientists and external experts/collaborators, and advice and direction from senior managers. Considerable judgment is required to ensure scientific (and operational) decisions with relatively small risks are made independently, while decisions with relatively large risks are made after receiving appropriate input or direction from Watershed Science Team Lead and senior managers.

Direct or indirect impacts of decisions:

This position provides scientific expertise in lotic quality at regional, provincial and national levels. Decisions made in this position shape surface water quality monitoring and research programming for OSM, the province and nationally.

The position also provides scientific input to the OSM Program's groundwater, surface water (lentic), wetland, hydrometric and other monitoring with a view towards better understanding and mitigating the environmental impacts of contaminants, groundwater withdrawal, and climate change on Alberta's water quality and resources.

The position has significant external environmental, economic, and social impacts by influencing:

- Information required to draft approval processes and regulations under the Alberta Energy Regulator, including the assessment of the effectiveness of regulations;
- Information needed by industrial applicants and operations in the energy, forestry, agricultural, and municipal sectors that may affect or be affected by water resources and/or climate change;
- Information required to support government relations with indigenous communities, environmental groups, and other stakeholders with interests in water resources and climate change.

Key Relationships

Major stakeholders and purpose of interactions:

Watershed Science Team Lead, OSM

- Daily to weekly interaction to discuss scientific, monitoring and operational issues related to approved priorities and work of the team.

Director, Environmental Science and Field Operations

- Daily to weekly interaction to discuss strategic and operational issues related to scientific priorities and work of the section; develop and monitor performance agreements; prioritize and lead operational and strategic planning.

EPA Leadership Team (Directors, Executive Directors, Chief Scientist)

- Weekly to monthly interactions to assist senior leaders in setting organizational priorities including developing strategic research plans; provide scientific input on water related issues of importance to the Department and Government as a whole.

OSM Scientists and other OSM Branch Staff

Provision of relevant scientific information to key OSM Branch contacts including daily to weekly interactions with:

- **OSM Watershed Monitoring Evaluation and Reporting Team**: collaborating with other scientists in the team on the delivery of OSM's lotic monitoring and science; providing scientific advice/environmental information related to OSM activities

·**Other OSM Watershed Teams:** working collaboratively with other OSM watershed scientists including groundwater, aquatic biology, wetland, and geospatial experts.
· **OSM Field Monitoring Team:** scientific input on data collection and water quality field work conducted by Technologists, including providing ongoing lotic quality data validation.
· **Community-Based Monitoring**: supporting the braiding of Indigenous and western science and knowledge.

Scientists and other staff in EPA and other Government of Alberta Departments including permanent staff, wage staff, co-op students, and interns
· Oversee and participate in the provision of relevant water quality scientific information to key EPA contacts.
· Key Department contacts outside EPA may include the Alberta Geological Survey, the Alberta Energy Regulator, Alberta Health, and Alberta Energy.
· Weekly or monthly interactions to provide scientific advice on lotic monitoring and research programs and to facilitate access to, and application of, scientific findings in the Government of Alberta and internationally.

Indigenous community members and their representatives
· Interactions to co-design water monitoring and research programs that are relevant to the information needs, questions and concerns of indigenous communities in the oil sands region of Alberta, consistent with the recommendations of the TAC, SIKIC and OC; programs may also directly involve community members in program delivery.

Provincial, national and international committees, task forces and boards
· Quarterly, annual, or occasional participation in multi-organizational and multi-jurisdictional teams to provide expertise, and to represent the Government of Alberta on water-related matters.

Graduate students and post-doctoral researchers
· Monthly or more frequent interaction as co-supervisor, or as part of supervisory committee for PhD and MSc students; external examiner at defenses and candidacy exams.

External scientists, including academia, industry, partner monitoring organizations, Government of Canada (e.g., Environment and Climate Change Canada, Department of Fisheries and Oceans), other provincial or territorial governments, and US Agencies including Environmental Protection Agency and Geological Survey)
· Interactions to lead and collaborate, where appropriate, on integrated lotic quality, quantity and biological monitoring and research programs and projects. Reviewing scientific literature, and draft manuscripts for journal articles and other reports; co-author publications with other organizations.

Required Education, Experience and Technical Competencies

Education Level	Focus/Major	2nd Major/Minor if applicable	Designation
Doctorate	Science	Science	Other

If other, specify:

Job-specific experience, technical competencies, certification and/or training:

The person filling this position is recognized as a water quality expert and is expected to enhance scientific expertise and capacity in the Alberta Government in relation to lotic science with a specialization in lotic quality and cumulative effects assessment and synthesis. Creative thinking may involve the identification of environmental thresholds in highly complex systems, and involvement in the design of cumulative effects management programs.

The position requires a PhD in a relevant scientific discipline related to lotic systems in more than one of the following areas: aquatic chemistry, aquatic ecology, statistics, sediment transport and fate, biogeochemistry, limnology and water resources. The position requires a minimum of 2 years post-doctoral or equivalent work experience in the design and implementation of water research and monitoring programs. In addition, the OSM Watershed Scientist (Scientific 3) must have a demonstrated record of primary and collaboratively authored publications in peer-reviewed scientific journals commensurate with established peers with a similar level of experience.

The position requires extensive knowledge and experience in the following areas:
- Watershed and ecosystem science with a focus on lotic systems
- Proven experience in water quality monitoring and assessment.
- Advanced numerical analyses using (geo) statistical methods of large environmental data sets using software such as *R,* including data from EPA's monitoring and/or research programs and relevant programs or studies

performed by others in Alberta and elsewhere.

- Application of appropriate models or other means to predict local, regional and cumulative impacts of a broad range of development and related activities at play in the oil sands region and Alberta as a whole.
- New and emerging methods related to assessing the status and trends in Alberta's watersheds and lotic systems.
- Current and emerging provincial and national watershed and lotic issues
- Relevant partnerships with academic and industrial research communities, relevant government and non-government agencies, etc.
- EPA's business plan, goals, strategic priorities, and accountability processes.
- Alberta's acts, environmental regulations, water quality standards, and policies and frameworks related to water resources.

The position requires the following skills and abilities:

- Demonstrated innovative and creative thinking, problem-solving, and strategic thinking skills.
- Strong knowledge of field sampling, laboratory analysis and data validation/verification.
- Strong data analysis, modelling and interpretation skills.
- Strong scientific writing skills, project management and program planning skills.
- Strong communication and interpersonal skills to develop and deliver understandable scientific information to key stakeholders, the scientific community, public audiences, and senior executives in government.
- Ability to build and maintain effective and productive working relationships, including with Indigenous communities, various internal and external researchers, post-secondary institutions graduate students, researchers, and specialized scientists.
- Ability to successfully manage multiple projects, meet timelines and work under pressure.
- Ability to identify, anticipate, and analyze complex issues.
- Ability to synthesize findings to identify risks, possible actions and where possible, solutions.
- Project management experience.

Behavioral Competencies

Competency	Level A B C D E	Level Definition	Examples of how this level best represents the job
Systems Thinking	○ ○ ◉ ○ ○	Takes a long-term view towards organization's objectives and how to achieve them: • Takes holistic long-term view of challenges and opportunities • Anticipates outcomes and potential impacts, seeks stakeholder perspectives • Works towards actions and plans aligned with APS values • Works with others to identify areas for collaboration	Develop and prioritize lotic monitoring and research programs aligned with OSM Program needs, and emerging lotic quality, quantity and biological and resource priorities identified by the international scientific community. Ensure integration between lotic system monitoring and research programs and other environmental monitoring and research programs in OSM

Creative Problem Solving	○ ○ ◉ ○ ○	Engages the community and resources at hand to address issues: • Engages perspective to seek root causes • Finds ways to improve complex systems • Employs resources from other areas to solve problems • Engages others and encourages debate and idea generation to solve problems while addressing risks	Develop research initiatives, new methods/techniques, and research proposals requiring analytical and/or interpretative thinking, creative thinking, and problem solving skills. Work with other OSM scientists to ensure innovative, scientifically credible research and monitoring protocols are conceived and deployed in OSM's lotic system monitoring and science programs.
Drive for Results	○ ○ ◉ ○ ○	Takes and delegates responsibility for outcomes: • Uses variety of resources to monitor own performance standards • Acknowledges even indirect responsibility • Commits to what is good for Albertans even if not immediately accepted • Reaches goals consistent with APS direction	Participates in diverse lotic science program generating new knowledge that enables creative solutions to current and anticipated lotic resource problems including contamination, changing water levels, impacts of industrial and agricultural activities, climate change, etc; Leads data analysis, as well as primary and collaborative authorship of standard and non-standard reporting products communicating major observations and conclusions of long-term monitoring and focused research activities on the condition, status and trends of Alberta's lotic systems including but not limited to peer-reviewed scientific papers.
Build Collaborative Environments	○ ○ ◉ ○ ○	Collaborates across functional areas and proactively addresses conflict: • Encourages broad thinking on projects, and works to eliminate barriers to progress • Facilitates communication and collaboration • Anticipates and reduces conflict at the outset • Credits others and gets talent recognized	Contribute to identifying and designing research programs delivered by teams involving academia, industry, indigenous community members, and government. Collaborate with OSM scientists, field monitoring technologists and others in all phases of monitoring and research programs, from conception to delivery and reporting

		• Promotes collaboration and commitment	
Develop Self and Others	○ ○ ◉ ○ ○	Plans according to career goals and regular development: • Aligns personal goals with career goals • Leverages strengths; attempts stretch goals • Provides feedback and openly discusses team performance • Values team diversity, and supports personal development	Effectively communicate complex scientific issues/ results to a wide range of expert and non-expert audiences, thereby ensuring Indigenous communities, government, industry, and the public can best employ or apply the information resulting from OSM's lotic monitoring, evaluation and reporting programs. Work within a team of watershed scientists to achieve approved scientific work and products. Contribute to developing a culture of scientific excellence in research and monitoring design.

Assign

The signatures below indicate that all parties have read and agree that the job description accurately reflects the work assigned and required in the organization.

Employee Name	Date yyyy-mm-dd	Employee Signature
Supervisor / Manager Name	Date yyyy-mm-dd	Supervisor / Manager Signature
Director / Executive Director Name	Date yyyy-mm-dd	Director / Executive Director Signature